WESTERN UPDATE #71

THE WESTERN NEWSLETTER FOR MF, LF, AND VLF EXPERIMENTERS

Available for business-size 25 cent SASE's, plus $1 per issue (or $10 per year)
from: Jim Ericson, 226 Charles St., Sunnyvale, CA 94086-6063

ACTIVE EXPERIMENTAL BEACON STATUS (LIST COMPILED FEBRUARY 27, 1990)

FREQ(kHz)	IDENT	LOCATION	SCHEDULE INFORMATION
163.80	FPV	Granada Hills, CA	Unknown. See alt. freq. 182.62 kHz.
166.503	C	Near Morro Bay, CA	24h/7d.
169.94	NRE	San Diego, CA	24h/7d.
171.139	K	Mountain View, CA	Unknown.
175.703	FAW	Orem, UT	24h/7d.
176.26	CO	Glenwood Springs, CO	24h/7d.
176.85	7FS	Belfair, WA	24h/7d.
177.75	CT	Pleasant Gap, PA	10 baud BPSK. Status unknown.
178.62	DJ	Los Banos, CA	24h/7d. Dave Johnson.
179.4	**3 GOATS**	**Portland, OR**	**24h/7d. New Bcn! KB7GRB Fred Lord.**
179.54	WJ	Arleta, CA	On, but intermittent.
180.224	F	Los Banos, CA	FSK. By request.
180.80	XU	Sioux Falls, SD	24h/7d. BPSK/CW alternating 5 minutes.
181.17	IZJ	San Gabriel, CA	Daily. Silent 0700 to 1100 UTC.
182.62	FPV	Granada Hills, CA	Unknown. See alt. freq. 163.80 kHz.
182.672	G	Palo Alto, CA	24h/7d.
182.88	H2	Descanso, CA	24h/7d.
183.160	PRK	Saratoga, CA	24h/7d. K6PRK.
183.544	MEL	San Jose, CA	24h/7d.
183.63	PLI	Burbank, CA	Intermittent.
183.74	ZI	San Jose, CA	24h/7d. Frank Butscher W6SZS.
184.016	EK(daid)	Sunnyvale, CA	24h/7d.
184.383	TI	Kingman, AZ	24h/7d.
184.39	HO	Pahoa, HI	By request (Sheldon Remington).
184.46	**MGX**	**Fresno, CA**	**24h/7d. Boyd Skillin. Note new Ident.**
184.5	TEXAS	NW of Ft. Worth, TX	24h/7d.
185.0	ZYK	Redway, CA	24h/7d.
186.84	BA	Lancaster, IL	24h/7d.
187.0	ELU	Simi Valley, CA	24h/7d. Saturday and Sunday A.M. on SSB.
187.2	CAT	Cincinatti, OH	24h/7d. Dave Raney.
187.50	DCH	Berlin, MD	Schedule unknown.
187.77	AZ	Tucson, AZ	24h/7d. Often silent 0400 to 0530 UTC.
190.4	OHH	Richmond Hill, Canada	Occasional testing.
525.+/-.76	T (dashes)	Sunnyvale, CA	A2 modulation. 24h/7d. Ed Gelinas.
1624.75	CT	Pleasant Gap, PA	24h/7d. 5 baud CCW. Clint Turner.
1631.54	A	Cleveland, N.C.	24h/7d. Ron Barlow.
1637.93	RR (daid)	San Rafael, CA	Sunset to Sunrise. Steve McGreevy.
1650.62	G4	Palo Alto, CA	24h/7d. Herb Vanderbeek.
1650.67	TI	Kingman, AZ	24h/7d. Rex Wilson.
1654.7	EK	Sunnyvale, CA	24h/7d. Jim Ericson.
1655.2	CO	Glenwood Springs, CO	24h/7d. Bob Cutter.
1661.35	U	San Diego, CA	Nights only. Steve Meyerpeter, KG6BY
1671.8	WJ	Arleta, CA	24h/7d. W6SZQ Wallie Jones.
1687.4	SD (daid)	Descanso, CA	24h/7d . Frank Cathell.
1688.2	TUS(daid)	Tucson, AZ	KD7QK. 0000 to 1400 UTC daily.
1688.45	**Z2**	**9 Mi. NW San Simeon, CA**	**Mike Mideke. By request.**
1689.1	AZ(daid)	Tucson, AZ	Greg Farkas. 0000 to 1400 UTC daily.

5 MORE SASES ON FILE

Non-Western listings are beacons currently being copied in the West, or they have SASE's on file with us.
Bold entries indicate recent changes, or new beacons. (daid) = dash after ident.

EK NOTES/MAILBAG: More good stuff to report, so it's time for another **WU** issue! Also, I have a lot of foreign business travel scheduled for March, so I figured we'd better get #71 published or it might get bumped into April.

My **EK** MedFER is still on, but seems to be one of the weakest signals on the band. I plan to add a decent ground system when I find time. Managed to have a nice MedFER QSO with neighbor **Herb Vanderbeek** (**G4**, Palo Alto, CA) at 7:30 P.M. on February 9th. Our QSO was totally accidental...and a lot of fun. Boy, do I need CW practice!

There's a new beacon on! **Fred Lord** of Portland writes, "I am currently sending **3 GOATS on 179.4 kHz** (there are three pigmy goats living near the antenna). I have heard **7FS** at 175 kHz and **XX** at 181 kHz. LF, VLF and ELF is fascinating stuff."

Boyd Skillin flashes from Fresno, CA that he has changed his ident from **B** to **MGX**. Nothing else has changed at 184.46 kHz, and the sked is still 24h/7d. Boyd says, "My next area of interest in LowFERdom is homebrew construction of some sort of portable receiver."

Ralph Burhans of Ohio submitted a nice article for this issue. It includes illustrations (without text) for an article submitted to the LOWDOWN for April publication regarding ceramic resonator IF filters. Ralph says to watch for the article, but that most readers only need the circuit diagram to get the idea.

Ken Cornell of NJ also submitted an article for this issue. Ken comments, "I received your WU#70 and I think that **Dave Raney's** article titled 'Finding LowFer Beacons, A Real Time Analysis' is one of the best that I have ever read. It is an honest and intelligent report on most all phases of the problems we encounter in our experimental endeavors."

Roy Keeley of Alabama checks in to report, "Enjoyed the WU so far. Being a new Ham and into ATV has destroyed my LowFer work for now, but no worry, the three newsletters keep me interested until I swing back!"

Mark Mallory of Utah telephoned on 21 February to report that he has changed jobs and that his beacons are off indefinitely (they were mounted on the roof of his work QTH). His new job in Salt Lake involves BPSK modulation stuff, so we'll doubtless be hearing more from Mark.

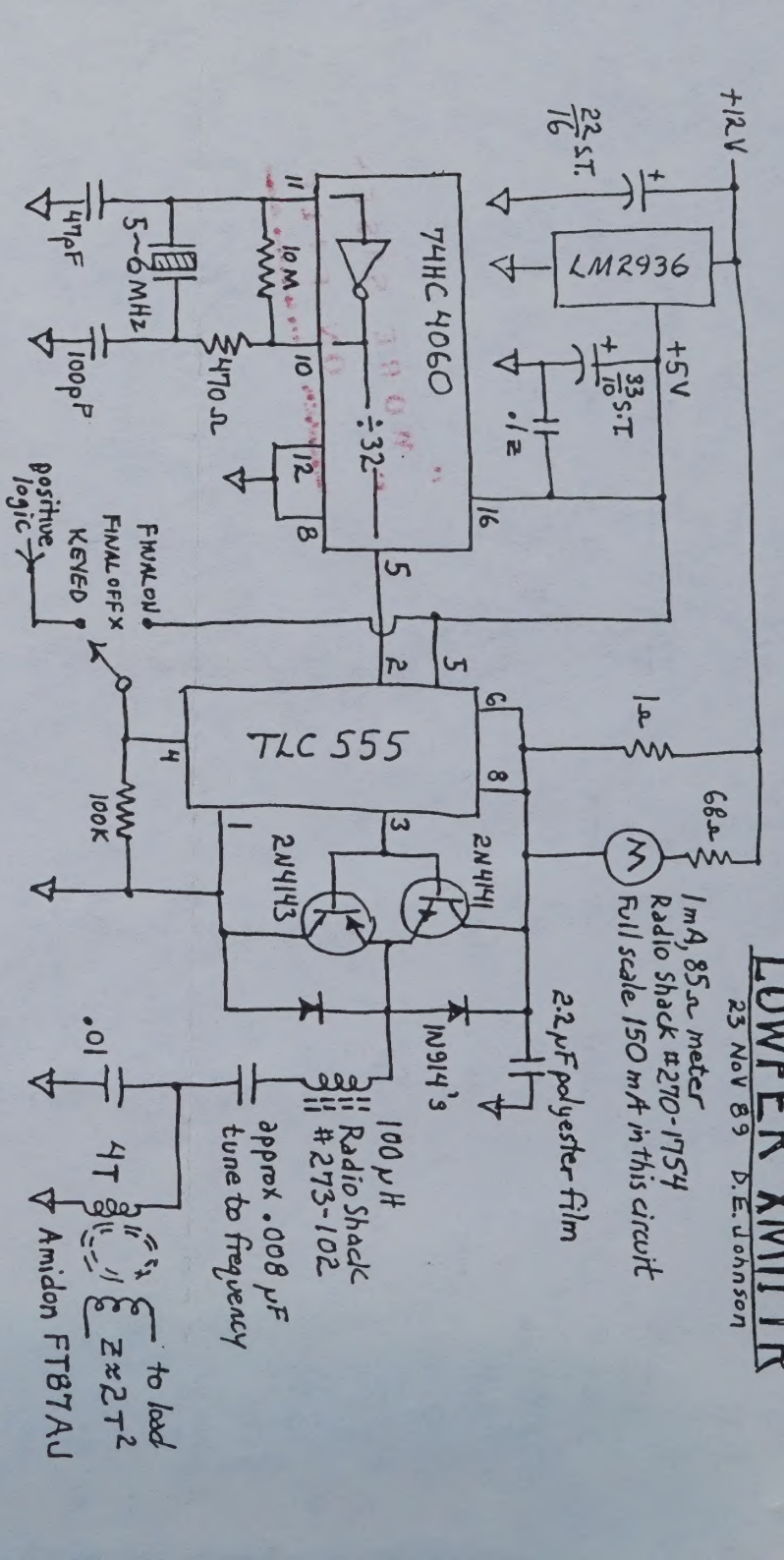
Ron Barlow of NC wrote, "My MF beacon **A** has been copied at **ABC** and **DAW's** QTH. **Todd Roberts** has improved his **ABC** antenna and the results are very noticeable. Since mid-January, LowFERs **WI, DCH, KRY, TH,** and **N** have been copied here. "

William Bowers of Chandler, OK notes, "I logged my first LowFer in my new home...the **TEXAS** beacon at 184.5 kHz. I can pick it up 24 hours a day, and it's 250 miles away! I'm using a Sony 2001D with LFE active whip."

New subscriber **Dr. John Schilke** (AH8AC in Oregon) has connected with **Vern Sahnow** (who used to run beacon **AVV**, but dropped VLF activity due to incredible local noise conditions). Hope you guys can get something going from Oregon!

Milt Wu of Columbus, NM wrote describing his, "...long dormant desire to learn the Morse Code language." Milt lives 7 miles from the Mexican border, and is active in a local Ham club in Deming. Milt is looking forward to getting active in LF/MF, and solicits any help or suggestions.

We can use more material for future editions of Western Update. Please get busy and send all camera-ready (or not!) goodies my way. Your inputs make this publication. I'm just the typist and envelope-stuffer! 73 for now, and happy Spring!



McGREEVY/ERICSON DO ANOTHER INSANE DX-PEDITION!

by: Jim Ericson

Yes, we did it again! On the heels of the idiotic dx-pedition of a year ago Christmas (where we nearly froze to death), Steve McGreevy and I again picked the coldest night of the year in California to go listening overnight. On February 12th we drove 90 miles north of San Francisco to Goat Rock Beach, where the Russian River meets the Pacific Ocean. Camping strictly prohibited, but what the heck!

First of all I should note that the receiver we were using at Goat Rock Park was Steve's Kenwood R-1000 with a Yaesu FRT-7700 preselector, followed by a preamp, and a 800 foot longwire antenna strung through brush along the beach. Audio filter was a Bencher XZ-2, and an LM 16 (WW -II vintage) spotting oscillator hooked to a Heath digital counter. Light was provided by a 12V automobile turnsignal bulb mounted in an aluminum funnel clipped to a metal paperweight. (We could see what we were doing without having to fiddle with flashlights!). My Yaesu 757GX and a 75 meter dipole suspended about 7 feet off the beach provided communications via amateur radio with **Mike Mideke** in San Simeon during the night. The whole mess was powered by a 30 A/H golf cart battery...which lasted (surprisingly) until morning. Everything was set up in the back of my 83 Ford Wagon.

Let's let Steve describe the night: "We began listening at 6:45 P.M., the MedFers **RR** San Rafael and **ER** (the temporary beacon I was running in Oakland) were very solid at about 50 miles. No trace of **G4** in Palo Alto. **TI** in Arizona was weak to fair. Slight traces of the new **EK** MedFer from Sunnyvale (100 miles south). At 7 to 7:15 P.M. LowFER **C** in Morro Bay was solid...best signal of the whole night! Cliff's LowFer **HDO** beacon from Morro Bay was faintly copied. LowFers **EK**, **PRK**, and **MEL** were very loud. **ZI** was also very good, but maybe 6 dB below **EK** (the strongest signal). At 7:30 P.M. **TI** MedFer was very solid, but not as strong as I've heard him in Nevada or Oregon on other DX-peditions. **Z2** MedFer was real loud, sending 'Ha Ha Ho Ho Ho Hum de Z2 Z2 Z2 San Simeon 93452.' **WJ** MedFer in Arleta, CA was quite strong -- best of the Southern California signals. **SD** in Descanso, CA was fair to good. **EK** MedFer was weak, but fair on peaks (best copy of night). At 8:15 P.M. the MedFer signals to the south weakened. An unidentified **TM** signal was heard on 1631.05 kHz. **RR** and **ER** signals are weaker than earlier...skip is obviously changing. 12:01 A.M. on February 13th local...**RR** and **ER** still weak, but **G4** Palo Alto is good. Only a trace of **EK** MedFer. **Z2** MedFer solid but weaker than earlier in the evening, now sending a regular **Z2** ident (which his intermittent keyer occasionally hiccupped into **D2**). A check of the NDB band indicated that propagation to the Pacific was beginning to come in (at 1615 kHz **OR** in New Zealand was coming in fine). At 12:15 A.M. the commercial AM broadcast station **KIKI** Honolulu was coming in strong over **WCCO** Minneapolis. Interestingly, there was no trace of the big Hawaiian NDB's at this time. But, at the same time...to the east, propagation was great. On 374.4 kHz **SA** (with DAID) Newfoundland had a good signal! **TUK** on 194 kHz in Massachusetts was fair and solid. LowFer **H2** was fair...solid with address and ID. **RR** and **ER** MedFers are stronger now than earlier. We kept listening all night without hearing **AZ** Tucson, **D** and **U** in Utah, **TUS** Tucson, or **CO** in Colorado. **Mike Mideke** reported via the ham link that he was hearing **AZ,** but we never copied it. Then, we slept from about 2 A.M. to 5:30 A.M. The temperature had dropped to 28 degrees...ice formed on the inside of the car windows. (Editor's note: Steve forgot his sleeping bag, and the one I had was designed for summer use, so neither of us slept very well. We just dozed fitfully and sort of survived!). At 5:50 A.M. **Z2** MedFer loud. **RR** and **ER** only fair through deep QSB. **TI** and **SD** weak to nil. Asian broadcast signals on 1053, 828, and 1287 kHz. At 6:10 A.M. **7FS** (LowFER) finally showed up with a fair signal from Washington! LowFer **C** in Morro Bay is fair, but not as strong as at 7 P.M. the night before. At 6:20 A.M. a new Chinese broadcast station was heard at 1640 kHz with parallel transmission on 5.880 kHz on shortwave...abruptly off at 6:32 A.M. Maybe a new station in a testing mode? At 6:35 A.M. **RR** and **ER** are getting very strong, but erratic and with deep fading. Propagation is shortening up. Traces of **EK** MedFer at 6:45 A.M. **G4** Palo Alto strong with deep fades. At 7:00 A.M. **RR**, **ER**, and **G4** are rapidly getting weaker. Yet, **Z2** in San Simeon is quite loud. The sun was coming up at this time. By 7:30 A.M. the band was dead, and we were ready to pack up, scrape the ice from the windshield, and head off to Pat's in nearby Gurneville to warm up with some pancakes and coffee!"

FUN WITH THE SIGNETICS NE602

CRYSTAL CONTROLLED OR VFO CONVERTER AND DIRECT CONVERSION RECEIVER

Ken Cornell (ARS W2IMB)
225 Baltimore Avenue
Point Pleasant Beach, NJ 08742

An article in the Oct.'89 issue of Monitoring Times Magazine on a shortwave converter using a Signetics NE602N Double-Balanced Mixer and Oscillator caught my eye. Reference was also made to an article that appeared in the Feb.'88 issue of QST on a "Neophyte Receiver" using the NE602N. I could not find the QST article, but Jim Ericson was kind enough to send me photostats of same. The article described a direct conversion receiver for 80 and 40 meters.

I purchased some NE602N's from the Small Parts Center, 6818 Meese Drive, Lansing, MI 48911 for $2.70 each. When ordering the devices, I asked for a manufacturers specification sheet, if available, and they were kind enough to send me same. I was very impressed with the available information and though the device is primarily offered as a VHF Cellular Radio Mixer/Oscillator, I was curious to see how it would perform in the Medium to Low Frequency Range as a reception device for the MEDFERS and LOWFERS.

To begin with, I take no credit for the designs herein, only the application.

My first project was a LF Converter shown in Fig. 1.

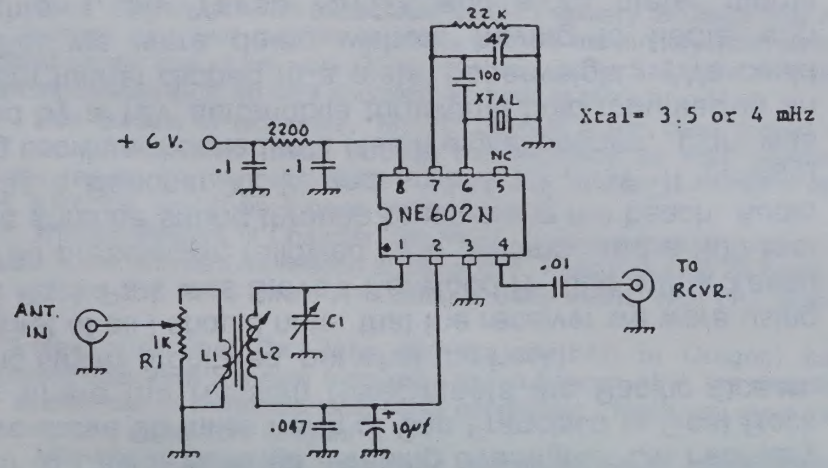


Fig. 1
Crystal Controlled Converter

FUN WITH THE SIGNETICS NE602 (cont'd.)

I used a 3500 kHz crystal. I wound L1 and L2 on a 5/16" dia. slug tuned form. I wound 300 turns of #32 en. wire for L2 and 75 turns of #32 en. wire for L1 using loose coupling between the windings. The 1 K pot. (R1) across the antenna coil L1 acts as a gain control and believe me, it is needed. I never copied Carl's "TH" stronger. I found that none of the vaues of external parts very critical and those shown are what I ended up with. The input voltage of 6 volts is recommended as the Maximum allowed is 9 volts. I use a battery as the current drain is well below 10 ma. There are no bias requirments as it is taken care of in the internal structure.

In tuning through the available range of 3.5 to 4 mHz on the receiver, I did notice some BC and other birdies. I was somewhat dissapointed by the lack of a sharp tuned input circuit (L1 & L2) I tried all the suggested designs and found all to be very broad. I was able to copy the Omega signals all the way up to the higher airport beacons with the coils L1 & L2 as described.

I will have to experiment with a better and sharper tuned input circuit. More later on this if possible.

MY next endeavour was to use the device as a direct conversion receiver for the 1600 to 1705 kHz band. In this case, The crystal had to be replaced with a tuneable circuit (VFO). I ended up with the circuit shown in Fig. 2.

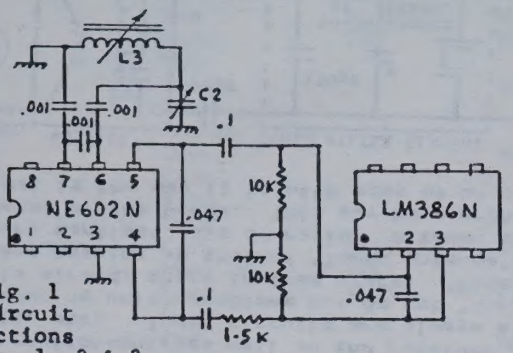
Pins 6 and 7 are the oscillator circuit connections and the design shown is basically a Colpitts configuration. For L3, I use 40 turns of #28 en. wire on a 5/16" dia. slug tuned form. The input circuit to pins 1 and 2 are the same as shown in Fig. 1 except for the inductance values for L1 & L2. For this frequency range, I used a variable capacitor of approx. 50 pf with a vernier drive for C2 and use the slug for setting the band coverage.

The output pins 4 and 5 are fed to pins 2 & 3 on a LM386N. The balance of the LM386N circuit is strictly "by the book" for an audio amplifier. This circuit is used in the QST article, however I found that while headphone volume was satisfactory, The speaker volume was a "forget it". I added a Radio Shack mini-audio amplifier to the LM386N's output and inspite of the mismatch, the speaker volume was very good. Separate power sources are required for the receiver and audio amplifier, in this case were needed, or an audio howl was deafening. I use a 6 volt lantern battery for the receiver and the audio amplifier (Radio Shack #277-1008) with internal 9 volt battery.

While I have not copied any MEDFERS yet, by adjusting the slug in L3 I can tune the 160 meter band and can copy the various SSB & CW stations with no difficulty.

In all cases, I use my 30" MPF102/2N3904 Active Antenna.

While the direct conversion receiver is very sensitive, here again I find the tuned input circuit from the antenna very broad as I mentioned in the converter discription.



Circuit connections to the LM386N not shown are of standard design.

See Fig. 1 for circuit connections to pins 1, 2 & 8.

Fig. 2

So let us take a closer look at what we have in these circuits:-

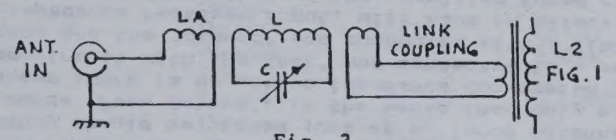
1) A crystal controlled converter. Using your heterodyne logic, you can convert most any frequency to another tuneable frequency range .

2) A direct conversion receiver for DSB, SSB and CW. By using a frequency counter on the local oscillator, you can have a digital frequency read out.

3) By using a tuneable local oscillator in the basic converter circuit (Fig.1), you can have a tuneable converter (using your heterodyne logic) to covert most any tuneable frequency range to a fixed frequency I.F. input.

While I feel that the NE602N is a remarkable device that deserves more recognition and use in the MEDFER and LOWFER bands, I feel that experimental endeavours as to improve the front end selectivity warrants futher experimentation.

ps:- After finishing the above text I tried a scheme that improved the front end selectivity remarkably. See Fig. 3.



LA- 1/3rd No. turns as as used in L.
L & C- Resonant at the operational Freq.
Link- Fewest turns as possible.

Fig. 3

NEWS FROM Z2: by Mike Mideke, San Simeon, CA. My MedFer **Z2** began a period of nighttime operation from the mountaintop site on February 7th on 1688.45 kHz. The on-site keyer suffered occasional glitches, sending **D2** sometimes. Occasionally the transmitter was under remote control, sending various messages. Regular transmissions from **Z2** concluded February 15th.
Transmissions may be available "on request" depending on availability of power.

With the exception of **TUS**, which remains a "maybe", I continue to copy all the known Western MedFers fairly easily. **TI** and **WJ** are generally the strongest. **EK** and the Salt Lake **D, U** are usually weakest.

February 13th UT was a nice Northeastern nighttime opening -- Ontario, Quebec, Nova Scotia, Newfoundland on the NDB band. Everything but Greenland! I continue to hear single-hop LowFers though perhaps not quite as frequently as 12 to 24 months ago. QRN has been difficult February 14th through 18th.

Information relayed from **Keith Olson (7FS in Washington)** on February 23rd UT -- Keith's friend **W7IZE** has been out at sea delivering a steamship from (I believe) San Diego to Honolulu, and listening for LowFers while he's been doing it! He heard **7FS** quite consistently at night, practically all the way to Honolulu. On February 19th sometime in the evening he copied **PRK** (Saratoga, CA) from a point about 600 miles SW of San Diego. Subsequently he copied the station **3 GOATS** on 179.4 kHz from the Portland, OR area, and that reception was from 900 miles west of San Diego. These were the only three LowFers heard by **W7IZE** on the trip.

Here's some news from **Sheldon Remington NI6E** in Hawaii relayed to me via a 10 meter ham QSO: Sheldon has the following MedFer receptions to report. All dates and times are UTC:

- Feb. 7th. 1040 to 1140. Very difficult copy of **CO**, around 10% copy with bad noise and lots of drift-net QRM. Ident cycle 16-2/3 seconds. DX 3140 miles.
- Feb. 7th. 1152 to 1156. **RR** easy copy 80%. 5.5 second cycle, medium-fast.
- Feb. 7th. Beginning 1158. **U** (San Diego) around 50% copy. 1.7 second cycle. Strong local AØ QRM. DX around 2505 miles.
- Feb. 7th. **TI** was QSO copy on several checks throughout the evening.
- Feb. 9th. **Z2** from 0956. 1688.47 kHz, 6.5 second cycle. 50% copy on peaks, nil on fades.
- Feb. 9th. **G** from 1023. Medium-fast, cycle around 2.2 seconds. About 20% copy.

On February 18th Sheldon heard the unidentified **SBT** 1620 kHz. Double sideband, 1020 Hz modulation, previously reported in the Northern Observer. Almost certainly a Latin American NDB.

And a late note -- I copied ELU/FPV having a 1750M SSB QSO on Saturday morning, February 24th!

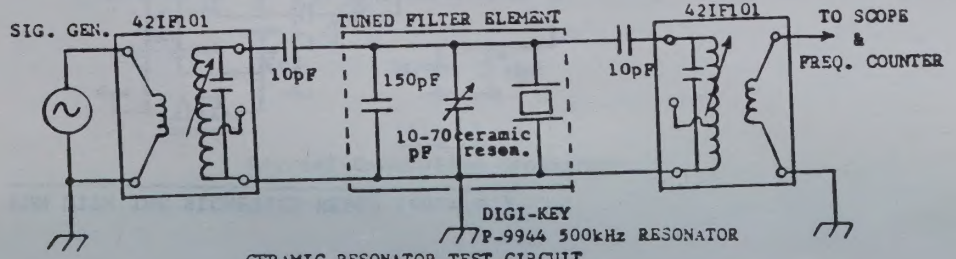
Ralph W. Burhans
161 Grosvenor St.
Athens, OH 45701

COMMENTS ON 'TUNED' WHIP ANTENNAS

The recent commentary regarding "Fake Active Whip" antennas probably should be viewed just as a "Tuned Antenna" system without the words "Fake Active", in the sense that only passive components are used and there is no active impedance conversion involved. A simple tuned circuit with the "hot" end connected to a small capacitive whip antenna and the "ground" end connected with a link or directly to a low impedance receiver input, will have an effective input impedance of QXL where "Q" is that of the resulting tuned circuit and XL is the reactance of the inductor at the frequency of interest. At frequencies like 100kHz the resulting number can be something like 500,000 ohms! Thus the input from the low capacitance whip, say about 10pF per meter of whip length, will have a reactance of about 150,000 ohms (XC) at 100kHz for a 1 meter whip.

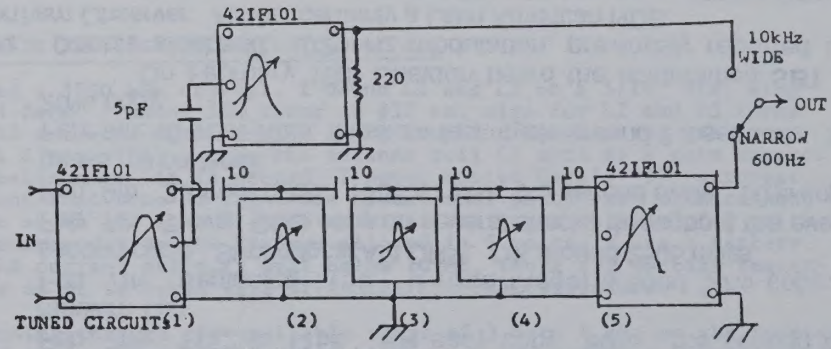
This then works into a load of 500,000 ohms which makes for a fairly good conversion of the actual signal level to an equivalent microvolt level at the low impedance receiver terminal of the inductor. In the actual case the capacitive voltage divider formed by any tuning of the inductor to ground as well as the series resistance of the inductor will reduce the impedance level somewhat. If the whip is just connected to the receiver input directly with no tuned circuit then the impedance mismatch can be something like 150,000 ohms (XC) to 50 ohms, which is a very high loss!

Thus a simple tuned circuit can do a very good job of increasing the available signal at the antenna because the antenna low capacitance is now much better matched to the electric field in free space, but over a very narrow frequency range in the longwave region. On the other hand, a truly "active" whip antenna can be effectively matched to the electric field over a reasonably wide frequency range with an active impedance converter, but may suffer from problems of distortion from strong signals or undesired pickup of signals depending on the quality of the amplifier system used and the local noise environment, as well as the receiver ability to reject off-band signals, etc. Tuned circuits are always a way of improving reception and reducing noise problems but do not "Actively" amplify the signal that is already there in free space. "Fake Active" does not convey the same meaning as that of "Tuned Antenna" which is well known from the very earliest days of radio. A tuned circuit is not a "Fake" in any sense of the words. This may be a problem of semantics, and if so, that is the way it is with most of us old timers.



CERAMIC RESONATOR TEST CIRCUIT

FIGURE 1.



5-STAGE 500kHz IF FILTER

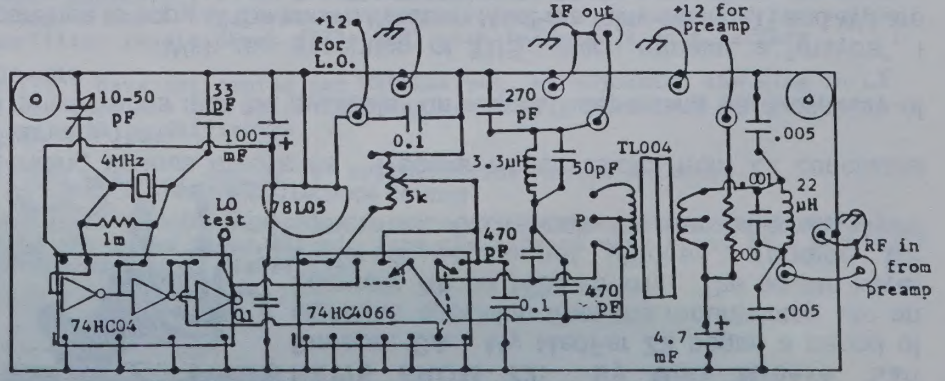
FIGURE 2.

BURHANS ELECTRONICS
161 Grosvenor St.
Athens, OH 45701

VLF-90A VLF-LF UPCONVERTER

Converter for the 10-500kHz RF input range to IF output of 4.01-4.5MHz (or 3.51-4.0MHz on special order) for use with standard communications receiver. Uses 74HC4066 as a balanced fullwave switch in an improved PC layout with a 74HC04 crystal oscillator and buffer. VLF-90A has identical performance to SD211 switch converter which is discontinued because of cost and transistor availability. This converter has improved dynamic range over diode ring mixers and comparable insertion loss with low 50 to 100 ohm input/output impedance. Not recommended for use with high-Z direct wire antennas without antenna tuner. Ideal for use with H-90A or A-86A, A-87 remote antenna preamps. Has built-in receiver coupler to power external preamps with +12V DC and separate terminal for +12V DC with +5V regulator for the local oscillator. Supplied as an assembled 1.1" X 3.1" circuit board tuned, tested, and L.O. bias adjusted for minimum L.O. leakage and maximum output signal level.

VLF-90A CONVERTER, 4.0MHz L.O. - price $35.
VLF-90A CONVERTER, 3.5MHz L.O. - price $40. (CK or MO, add $3 for S&H)



CIRCUIT LAYOUT FOR VLF-90A CONVERTER with 4.0MHz L.O.

Aldrich	Daniel			8030 Petit Verdot Court	Sacramento	CA	95829	
Anderson	Brice	BA	W9PNE	PO Box 14	Lancaster	IL	62855	(618)299-2441
Armstrong	Lloyd			3813 Lancaster Drive	Pueblo	CO	81005-3065	
Ashley	Lynn			2401 N. Vernon St.	Arlington	VA	22207	(703)522-5308
Bahr	Leland	LEE	W0VT	914 Golden Bear Lane	Kingwood	TX	77339-2914	(713)359-5284
Baker	Brad			21024 Bear Creek Road	Los Gatos	CA	95030	
Balfour	Herb	OHH	VE3OHH	91 Elgin Mills Road West	Richmond Hill (Canada)	ONT	L4C4M1	(416)884-5355
Barlow	Ron	A	N4GJV	14245 Cool Springs Road	Cleveland	NC	27013	
Bauer	Frank	FB	W6FPO	PO Box 1086	Felton	CA	95018	(408)335-7392
Bittner	Mike			27215 Sunnyridge Road	Palos Verdes	CA	90274	
Bond	Robert		WD6BCN	1420 McLoughlin Avenue	Oxnard	CA	93035	(805)985-0159
Borglum	James			5549 Lesa Road	La Mesa	CA	92041	(619)464-3250
Bowers	William			Rt. 3, Box 177 AC	Chandler	OK	74834	(916)377-4237
Bradley	Dave		W6CUB	PO Box 2043	Freedom	CA	95019-2043	
Bumpus	Carle			930 Idylberry Road	San Rafael	CA	94903	
Burhans	Ralph			161 Grosvenor Street	Athens	OH	45701	(614)593-8207
Burr	David			505 Mackenzie Drive	Lima	OH	45805	
Buttschardt	Cliff	HDO, C	W6HDO	950 Pacific Street	Morro Bay	CA	93442-2327	(805)772-2132
Carter	Max	MAX		46 - 14th Street	Wheatland	WY	82201	(307)322-9439
Cathell	Frank	H2, SD	K3YAZ	PO Box 535	Descanso	CA	92016	(619)445-8167
Chalmers	Doug			450 Adobe Place	Palo Alto	CA	94306	
Chaplin	Carl		W7Q0	Box 2800	Minden	NV	89423	
Chappell	Vernon			4511 - 36th Street #6	San Diego	CA	92116	
Coote	James	J	WB6AAM	808 North Ave. 66	Los Angeles	CA	90042	(213)258-7490
Cornell	Ken		W2IMB	225 Baltimore Avenue	Pt. Pleasant Beach	NJ	08742	
Costa	Bob		KB6QXM	P.O. Box 600	Redwood Estates	CA	95044	(408)353-3656
Cripe	David			7908 Wellesley Court	Pasadena	MD	21122	
Curry	David	PLI	WD4PLI	852 N. Lima Street	Burbank	CA	91505	(818)846-0617
Cutter	Robert	CO	KIØG	701 19th Street	Glenwood Springs	CO	81601	
DeVaughn	Bob	NBD	K3NBD	829 Estella Street	Pittsburgh	PA	15210	(412)488-1479
Dorman	Mike			15635 21st Ave. SW	Seattle	WA	98166	(206)246-3796
Edwards	Bill			PO 1229	Cowpens	SC	29330	
Egleston	Allan			20601 Resort Road	Sonora	CA	95370	(209)532-7111
Ericson	Jim	EK	KG6EK	226 Charles Street	Sunnyvale	CA	94086-6063	(408)773-8947
Farkas	Greg	AZ	AK7Y	PO Box 17074	Tucson	AZ	85731-7074	(602)749-4796
Farnsworth	Charles			506 Rutledge Drive	Lodi	CA	95240	
Faulkner	Charles	FPV	W6FPV	15844 McKeever	Granada Hills	CA	91344	(818)366-6210
Fisher	Montie		WA5TSL	808 Brett Drive	Edmond	OK	73013	
Fornek	Stan		K9IXC	640A Rance Road	Oswego	IL	60543	
Gelinas	Ed	T (dashes)	WA6AJY	557 N. Bayview	Sunnyvale	CA	94086	
Gosenca	Michael			203 Cherry St.	Eaton Rapids	MI	48827	
Grater	Jim			1136 S. Johnson St.	Lakewood	CO	80226-5113	
Griffith	Anthony			117 White St.	McMinnville	TN	37110	
Hedspeth	Scott	N3S	WB4YZA	Route 4, Box 227	Mocksville	NC	27028	(704)284-4021
Helms	Bernard			4210-1 Walnut	Berrien Springs	MI	49103	
Herr	George			6690 Vista Del Mar #1	Playa Del Rey	CA	90293	
Holland	David	DCH	K3YAY	300 South Main Street	Berlin	MD	21811	
Hooper	William		KF6AR	366 S. El Monte Road	Los Altos	CA	94022	
Hoopes	John			1084-B Sergeants Drive	Robins AFB	GA	31098	
Johnson	Dave		WA4NID	PO Box 389	Gainesville	FL	32602	
Johnson	Dave	F, DJ		713 Texas Ave.	Los Banos	CA	93635	(209)826-0841
Johnson	Don	AU	W9TIF	3304 Roxford	Champaign	IL	61821	(217)398-4020
Jones	Ron		K7RJ	9241 S. Toni Lee Circle	West Jordan	UT	84088	(801)561-2685
Jones	Wallie	WJ	W6SZQ	9090 Nagle Ave.	Arleta	CA	91331	(818)892-0552
Kassel	Charles			114 Church Drive	Mastic Beach	NY	11951	
Keeley	Roy		KC4IMC	10675 Salt Air Road	Theodore	AL	36582	(205)973-2516
Keller	Eb			2984 Fallwood Lane	San Jose	CA	95132	(408)263-6229
Kincaid	Nilan		W6EIG	5529 W. 140th Street	Hawthorne	CA	90250	(213)643-5269
Kraus	Howard		K2UD	372 Callodine Avenue	Amherst	NY	14226-2971	(716)838-2406
LaGrua	Michael			Box 549	Caspran	MI	49915-0549	
Layer	Hal		N6SPD	PO Box 27676	San Francisco	CA	94127	(415)661-6958
Lee	Mitchell	MEL	KB6FPW	172 North 24th Street	San Jose	CA	95116	(408)298-3026
Lehrbaum	Rick		AC1I	3275 Stockton Place	Palo Alto	CA	94303	
Leonardelli	John		VE3IPS	Box 722, Station A	Downsview (Canada)	ONT	M3M3A9	(416)636-3300

Lingwall	John			PO 70, 1025 Trinidad	Calhan	CO	80808	
Lord	Fred	3 GOATS	KB7GRB	10030 N.W. Cornell	Portland	OR	97229	
Mallory	Mark	MPM, D, U	WB7CAK	5196 Cobblecreek Road #7K	Salt Lake City	UT	84117	
Manley	Dean		KH6B	2058 Ainaola Drive	Hilo	HI	96720-3638	(808)959-8257
Marshall	Dave			440 Larry Drive	Florissant	MO	63033	
Martin	Steve		NK3R	141 Bridgecreek Drive	Goose Creek	SC	29445	(803)797-3143
Mawhinney	Scott	T (dashes)		295 Pettis Avenue	Mountain View	CA	94041	(415)960-1041
Maxwell	James		W6CF	PO Box 473	Redwood Estates	CA	95044	(408)353-2094
McGreevy	Steve	RR, ER	N6NKS	45 Elda Drive	San Rafael	CA	94903	(415)479-4259
Mideke	Mike	Z2	WB6EER	Box 123	San Simeon	CA	93452-0123	
Morgan	Robert			2817 West St. Anne	Rapid City	SD	57702	
Mozzochi	C.J.			PO 60	S. Glastonbury	CT	06073	
Mussler	Mike			Bonanza Star Route	Nederland	CO	80466	
Nickerson	Rick	R	KB6JQU	3224 Saxonville Way	Sacramento	CA	95842	(916)348-1466
Norman	Charles			4938 Spirit Court	Stone Mountain	GA	30087	
Olson	Keith	7FS	W7FS	E. 15470 Highway 106	Belfair	WA	98528	(206)275-2560
Osterud	Jim			519 Capri Circle	Tooele	UT	84074	
Otacilio P. de Sousa	José			Rua Calisto 62, Recanto dos Vinhais	São Luis, MA, Brasil	PR8BNP	65070	
Owens	James	Q	NW00	1363 Tipperary	Boulder	CO	80303	
Palermo	George			1444 First Street, Suite A	Sarasota	FL	34236	(813)365-7777
Paschal	Ev			Sinclair Island	Anacortes	WA	98221	
Pelmulder	Jim		N6PTM	2801 Gravenstein Highway	Sebastopol	CA	95472	
Pepe	Bill		WA2TDR	Box 1915	Bloomfield	NJ	07003	
Peterson	Art			851 31st Street	Richmond	CA	94804	(415)234-2014
Phillips	Ed	IZJ	W6IZJ	408 North Alabama Street	San Gabriel	CA	91775	(818)285-8308
Pomplun	Don		K2BIO	521 Van Buren Place	San Ramon	CA	94583	(415)829-7648
Post	Kendall			1842 Hoffman Street	Madison	WI	53704	(608)244-0500
Raney	David	CAT	WC8E	4128 Linden Avenue	Cincinnati	OH	45236	(513)791-0740
Rappold	Sam	ZYK	WB6ZYK	PO 1267/479 Briceland Road	Redway	CA	95560	
Ratzlaff	Steve	SR	AA7U	295 Pettis Ave.	Mountain View	CA	94041	(415)965-7623
Rausch	Bill		AA6PA	820 Warren Way	Palo Alto	CA	94303-3627	(415)327-4662
Raven	Gregory	TEXAS	KF5N	4550 Sunnybank Court	Fort Worth	TX	76137	(817)485-6771
Reid	Frank		W9MKV	Box 5283	Bloomington	IN	47407-5283	
Remington	Sheldon	HO	NI6E	PO Box 2094	Pahoa	HI	96778	(808)966-6946
Roberts	Todd	ABC	WD4NGG	PO Box 21413	Hilton Head Island	SC	29925	(803)681-8114
Schick	D.H.			580 N. Buena Vista Dr.	Lake Alfred	FL	33850	
Schilke	John		AH8AC	184 Harding Blvd.	Oregon City	OR	97045	(503)656-9216
Seabury	Tom			PO 535	Diablo	CO	94528	
Seamons	John	JKS	KF6VO	95 Holstein Road	San Anselmo	CA	94960	(415)456-6090
Seden	Randy	ELU, U	WD6ELU	1272 Harold Avenue	Simi Valley	CA	93065	(805)583-5687
Skillin	Boyd	MGX	K6MGX	3876 East Pico	Fresno	CA	93726	(209)222-0275
Smith	Randy			19515 Frederick Rd. #135	Germantown	MD	20874	
Snow	John		N6AMZ	3708 Judah Street	San Francisco	CA	94122-1227	
Spaulding	Fred		K1YQP	883 San Simeon Drive	Mountain View	CA	94043	(415)961-5018
Spencer	Chris	FAW	WB7FAW	722 West 1850th North	Orem	UT	84057	(801)225-7852
St. Angelo	Michael		N2MS	61-16 80th Avenue	Glendale	NY	11385	
Statom	Mike			1604 S. Campbell Avenue	Alhambra	CA	91803	(818)289-7170
Stewart	Don			2617 Anza Street	Bakersfield	CA	93305-3109	(805)871-7024
Stinson	Dave	R	AB5S/7	HCR 65, Box 71053	Pahrump	NV	89041	(702)727-4370
Strong	David			4231 E. Grove Street	Phoenix	AZ	85040	
Sullivan	John			2069 Touraine Lane	Half Moon Bay	CA	94019	
Taylor	Bill			327 Camino Del Campo	Redondo Beach	CA	90277	(213)378-5628
Thompson	Arliss	XU	W7XU	Route 1, Box 52	Colton	SD	57018	(605)446-3687
Tracy	John		WB7AMC	10431 Miller Ave.	Cupertino	CA	95014	(408)257-9585
Trinkaus	George			4326 S.E. Woodstock, #489	Portland	OR	97206	
Turner	Clint	CT	KA7OEI	145 West Street	Pleasant Gap	PA	16823	(814)359-2663
Vanderbeek	Herb	G4	WY6G	630 Ashton Avenue	Palo Alto	CA	94306	(415)493-1726
Vandermaaten	Jim	SM	WB6QZL	1276 Tourney Drive	San Jose	CA	95131	(408)258-6872
Waldsmith	Gary	SUK	K4SUK	1441 Hound Hollow Road	Pilot Hill	CA	95664	(916)933-3815
Weiss	Jim		W9ZMV	c/o Radio WTAQ	LaGrange	IL	60525	(312)579-9104
Welch	James		KK6N	3071 Mauricia Avenue	Santa Clara	CA	95051	
Wilson	Rex	TI	KB7TI	4550 Vernetti Lane	Kingman	AZ	86401	(602)757-3649
Wisniewski	Wit			1421 N. Sarnoff Drive	Tucson	AZ	85715	(602)721-8412
Wright	Rick	1SUN	KA5YWH	Box 4181, Station A, SEOSU	Durant	OK	74701	(405)924-3699
Wu	Milt			Box 308	Columbus	NM	88029	(505)531-2565
Wyatt	Frank		N6FW	855 Ticonderoga Drive	Sunnyvale	CA	94087	(408)737-8155